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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/719,422 | 12/12/2000 | Yoshihisa Furuta | Q 62228 | 7788 |

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EXAMINER

MUSSER, BARBARA J

ART UNIT

PAPER NUMBER

1733

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/719,422

Applicant(s)

FURUTA ET AL.

Examiner

Barbara J. Musser

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by or , in the alternative, under 35 U.S.C. 103(a) as obvious over Aizawa et al.(U.S. Patent 5,609,954).

Aizawa et al. discloses a pressure sensitive adhesive tape which has an adhesive strength of less than 400 gf/20 mm at ambient temperature after heating to 150 C.(Abstract; Table 1; Col. 2, ll. 50-52) One in the art would expect that the adhesive would have the same or even less strength if heated to a higher temperature. The reference discloses the backing is a polyester film(Col. 6, ll. 6) and applicant uses polyethylene terephthalate(a polyester), indicating the material has a thermal shrinkage of less than 3%.(Pg. 5, ll. 24)

Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a backing with a low thermal shrinkage as

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otherwise the difference between shrinkage of the base and expansion of the adhesive would separate the adhesive from the backing, making it impossible to remove the adhesive as is intended in the reference.

4. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Aizawa et al.(U.S. Patent 5,441,810).

Aizawa et al. discloses a pressure sensitive adhesive tape which has an adhesive strength of less than 400 gf/20 mm at ambient temperature after heating to 170 C.(Col. 8, ll. 8) One in the art would expect that the adhesive would have the same or even less strength if heated to a higher temperature. The reference discloses the backing is a polyester film(Col. 7, ll. 17) and applicant uses polyethylene terephthalate(a polyester), indicating the material has a thermal shrinkage of less than 3%.(Pg. 5, ll. 24)

Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a backing with a low thermal shrinkage as otherwise the difference between shrinkage of the base and expansion of the adhesive would separate the adhesive from the backing, making it impossible to remove the adhesive as is intended in the reference.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al.(U.S. Patent 5,273,938) and as evidenced by High Performance Films.

Mostafazadeh et al. discloses adhering an adhesive tape to a lead frame having a chip mounted therein, encapsulating the chip and connectors with molding resin, and stripping the tape away.(Figures 5-7; Col. 1, ll. 63- Col. 2, ll. 19) The reference does not disclose the specifics of the adhesive tape but does disclose the tape can be polyimide.(Col. 3, ll. 46). Lin et al. discloses a method of forming chips which are attached to traces and encapsulated wherein the chips and traces are applied to a Kapton film.(Col. 2, ll. 64- Col. 3, ll. 2) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a Kapton film as the basis for the adhesive tape in Mostafazadeh et al. since Lin et al. discloses Kapton film is a well-known film in this art and since Mostafazadeh et al. discloses that any polyimide film can be used.(Col. 3, ll. 46) Neither reference discloses the thermal shrinkage of the tape. High Performance Films discloses that Kapton has thermal shrinkage of 0.10% at 200C. Thus one in the art would understand the film of Lin et al. in the process of Mostafazadeh et al. would have a shrinkage of less than 3%.

While Mostafazadeh et al. does not specifically disclose using a mold to form the resin encapsulated chips, the reference does disclose that a molded plastic casing is formed over the chip.(Col. 2, ll. 13-14) One in the art would understand that a molded casing was made using a mold.

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7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al. and High Performance Films as applied to claim 1 above, and further in view of Oida et al.(WO 98/35382) U.S. Patent 6,291,274 is considered an English language translation and all column and line numbers refer to it.

The references cited above do not disclose replacing the lead frame of Mostafazadeh et al. with a tape carrier. Oida et al. discloses tape carriers can be used in place of lead frames when encapsulating chips in resin.(Col. 10, ll. 39-45) It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the lead frame of Mostafazadeh et al. with a tape carrier since such is well-known and conventional in the art as shown for example by Oida et al.(Col. 10, ll. 39-45)

8. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mostafazadeh et al. in view of Lin et al. and High Performance Films as applied to claims 1 and 4 above and further in view of Aizawa et al. '954.

Neither reference discloses the type of adhesive used. Aizawa et al. discloses an adhesive used as a carrier for articles such as semiconductor chips for temporary fixing(Col. 5, ll. 3-8) The adhesive has a low adhesive strength after heating since the adhesive expands on heating reducing the adhesive strength.(Abstract; Col. 2, ll. 50-53) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the adhesive of Aizawa et al. on the film of Lin et al. in the process of Mostafazadeh et al. since the adhesive can hold electronic parts securely and can be easily removed(Col. 1, ll. 22-42) which is important since the chip bottoms of

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Mostafazadeh et al. can be bonded to other materials and particularly since the adhesive is known in the electronic arts.

Response to Arguments

9. Applicant's arguments filed 8/25/03 have been fully considered but they are not persuasive.

Regarding applicant's argument that Mostafazadeh et al. does not disclose that the purpose of the tape is for providing a method of encapsulating the chip while the reference uses the tape to support the chip, both applicant and the reference use the tape to maintain the position of the chip in the lead frame during assembly. (Col. 3, ll. 46-48) The fact that the reference does not use the exact same words to describe the purpose of the tape of Mostafazadeh et al. as applicant uses does not mean they are not performing the same function. Since the tape of Mostafazadeh et al. is present when the molding material is applied to the chip, it also functions as part of the equipment used to encapsulate the chip.

Aizawa et al. '810 and '954 are cited to show that tapes of applicant's description, namely tapes with an adhesive containing microspheres which expand on heating are known in the adhesive tape arts. While the references are silent as to the shrinkage, they use the same type of material as applicant as the backing. Since applicant's tapes have a thermal shrinkage of less than 3%, the tapes of the reference would have a thermal shrinkage of less than 3%. Alternatively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a

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backing with low shrinkage as otherwise the large discrepancy between the adhesive and its backing would result in separation of the adhesive from its backing, which would be undesirable in situations where the tape and adhesive are intended to be removable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Barbara J. Musser** whose telephone number is **(703)-305-1352** until December 20 when it changes to (571) 272-1222. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


BJM


JEFF H. AFTERGUT
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